



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,734	08/05/2003	Naoyuki Enjoji	IIW-030	8848
959	7590	02/09/2006	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			KALAFUT, STEPHEN J	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/635,734

Applicant(s)

ENJOJI ET AL.

Examiner

Stephen J. Kalafut

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 13-16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 7-12 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 14 August 2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Art Unit: 1745

Claims 3, 6, 9, 12, 15 and 20 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. These claims recite that the “conductive fiber aggregated material” is used instead of the “porous metal material” of the respective parent claims. By removing a material required by their parent claims, these claims would be outside the scope thereof.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 4, 6, 13, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Vyas *et al.* (US 6,866,958).

Vyas *et al.* disclose a separator (112) used in a fuel cell, comprising a mixture of a polymeric material (113) and a conductive fiber (114) such as metal (column 6, lines 23-58). This would constitute a conductive fiber aggregated material with a polymer impregnated therein. The spaces between the fibers would constitute pores, thus rendering the material a porous metal. As seen in figure 7, the separator includes gas flow passages. The separator also includes a conductive outer plating (94), which would be located on the metal exposed to the

Art Unit: 1745

surface thereof. Recitation of how any parts were made are treated under product-by-process practice, *in re Fitzgerald* 205 USPQ 594, and per se do not carry any patentable weight, being process steps within product claims. See MPEP 2113.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vyas *et al.* in view of Cisar *et al.* (US 6,638,657).

These claims recite or encompass metal foam as the metallic component of the separator. Cisar *et al.* disclose a fuel cell separator (70) having metal foam flow fields (72) and a gas barrier (74) in the central part thereof, which includes polymer impregnated into the metal foam (column 5, lines 15-21). Because of the gas sealing afforded by this arrangement, it would be obvious to use the polymer-impregnated foam of Cisar *et al.* as the composite structural material of the separator of Vyas *et al.* Both the foam and the fibers would provide conductivity, while both polymers would provide gas sealing.

Claims 4, 6, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vyas *et al.* in view of Braun (US 6,451,471).

Vyas *et al.* disclose a process of making a fuel cell separator comprising the steps of mixing fibrous metal with polymer, thus impregnating the metal with polymer; forming gas flow passages on the opposite surfaces of the resulting body; and applying a conductive plating (94) to the surfaces thereof, including the metal thereon. These claims either differ from Vyas *et al.* by reciting a step of machining the surface to expose the metal thereon, or may be interpreted as reciting such a step, if the process steps in article claims 4 and 6 are given weight. Braun disclose a process of making a fuel cell separator, in which the lands are reduced in height by an operation such as machining, which ensures a high level of flatness and parallelism, and improves their conductivity (column 4, lines 45-61). For these reasons, it would be obvious to machine the lands between the gas passages of Vyas *et al.*, as shown by Braun.

Claims 4-6 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vyas *et al.* in view of Braun as applied to claims 4, 6, 18 and 20 above, and further in view of Cisar *et al.*, above.

For reasons noted above, it would be obvious to use the polymer-impregnated foam of Cisar *et al.* as the composite structural material of the separator of Vyas *et al.*

Claims 7-12 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art cited herein or by applicants does not disclose a separator for a fuel cell comprising a porous or foamed metal impregnated with a polymer, a conductive plating on its outer surface, and a structural retaining part comprising gas openings

Art Unit: 1745

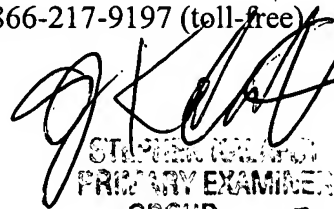
made of the same polymer used in the porous or foamed metal part, and continuously formed around the metal part. In order to be allowable, claims 9 and 12 must also be rendered free of the above-noted objection under 37 CFR 1.75(c).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Keegan (US 6,613,469) discloses a separator for a solid oxide fuel cell, in which the surfaces are machined. King (US 6,531,238) discloses a fuel cell separator made of porous foamed metal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


STEPHEN J. KALAFUT
PRIMARY EXAMINER
GROUP 1700